Before the

Federal Communications Commission

Washington, D.C. 20554

In the Matter of	)	
	)	
Use of Spectrum Bands Above 24 GHz for Mobile Radio Services	)	GN Docket No. 14-177
	)	
Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services	)	WT Docket No. 10-112

REPLY COMMENTS OF TELESAT CANADA ON THIRD FURTHER NOTICE OF PROPOSED RULEMAKING

I. Introduction and Summary

This reply is submitted by Telesat Canada ("Telesat") in respect of the Commission's Third Further Notice of Proposed Rulemaking ("3rd FNPRM") in the above-captioned proceeding. Telesat operates a global fleet of geostationary ("GSO") satellites and has been granted market access by the Commission for its planned Ka-band low earth orbit ("LEO") non-geostationary ("NGSO") constellation. Telesat also has a pending application before the Commission for a V-band LEO NGSO constellation using, *inter alia*, the 50.4-51.4 GHz band (the "50 GHz band") and there are a number of other granted and pending V-band GSO and NGSO applications before the Commission. These satellite networks will support high-speed broadband services throughout the U.S., including in areas that are currently unserved and underserved, and will enhance competition for broadband services in other areas. Telesat's V-

band NGSO constellation, in particular, will support fiber-like high-speed broadband services throughout the U.S. and the rest of the world.

In the 3rd FNPRM, the Commission has proposed to permit non-federal fixed-satellite service (FSS) use of the 50 GHz band in accordance with the sharing rules it has established for the 24.75-25.25 GHz band (the 24 GHz band). These rules include a numerical cap on earth stations in a county and Partial Economic Area (PEA), limits on population coverage within the specified power flux density (PDF) contour[1] of all licensed earth stations in a county, and a prohibition on earth stations with a PFD Contour that contains a major event venue, urban mass transit route, passenger railway or cruise ship port or crosses an Interstate, Other Freeway or Expressway or Other Principal Arterial based on the Federal Highway Administration classification system.

Telesat applauds the Commission for moving forward on establishing rules for shared use of the 50 GHz band by FSS. These rules are an essential input to finalization of the design of the innovative new satellite networks that are being planned in the band and that will offer tremendous benefits to U.S. consumers and businesses. While the sharing rules established for the 24 GHz band are a reasonable starting point for sharing rules for the 50 GHz band, as other satellite operators have stated in their comments, the different technical characteristics of the 50 GHz band – namely, reduced propagation distances of 50 GHz signals – support some adjustments to the sharing rules. Specifically and as discussed more fully below, the shorter distances travelled by 50 GHz signals support relaxation of the numerical caps and population and other coverage limits, particularly in Tier 2 and Tier 3 population areas. By tailoring the 50

[1] Defined as the area in which the earth station generates a PFD, at 10 meters above ground level, of greater than or equal to -77.6 dBm/m^2/MHz (the "PFD Contour").

GHz sharing rules to the characteristics of the band and expected terrestrial 5G deployment, the Commission will facilitate efficient use of the spectrum.

II. Sharing Rules Are Required Now

There is widespread support in the comments for the establishment of rules for shared FSS use of the 50 GHz band. Satellite operators uniformly support 50 GHz sharing rules[2] and all but one of the limited number of the terrestrial operators and associations and equipment manufacturers commenting on the band accept the Commission's proposal to identify sharing rules[3]. While Nokia suggests it would be premature to establish sharing rules until rules for UMFUS use of the band have been established, this proposition ignores the fact that satellite operators are planning systems that will use the 50 GHz band now and require certainty on the rules for shared access to the band to finalize the design of these satellite systems.

III. The Propagation Characteristics of the 50 GHz Band Warrant a Different Approach from the 24 GHz Band

As indicated above, the Commission has proposed to apply the sharing rules established for the 24 GHz band to FSS use of the 50 GHz band. However, as SES, SpaceX and Boeing have pointed out in their comments[4], the distance that 50 GHz signals can travel is significantly

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[2] Comments of Echostar Satellite Operating Corporation and Hughes Network Systems, LLC, Third Further Notice of Proposed Rulemaking, GN Docket No. 14-177, WT Docket No. 10-112 (September 10, 2018); Comments of SES Americom, Inc. and O3b Limited on Third Further Notice of Proposed Rulemaking, GN Docket No. 14-177, WT Docket No. 12-112 (September 10, 2018) (SES Comments), Comments of Space Exploration Technologies Corp., GN Docket No. 14-177, WT Docket No. 10-112 (September 10, 2018) ("SpaceX Comments), Comments of Viasat, Inc. to Third Further Notice of Proposed Rulemaking, GN Docket No. 14-177, WT Docket No. 10-112 (September 10, 2018), Comments of the Boeing Company, GN Docket No. 14-177, WT Docket No. 10-112 (September 10, 2018) ("Boeing Comments").

[3] Comments of Ericcson, GN Docket No. 14-177, WT Docket No. 10-112 (September 10, 2018), page 14; Comments of AT&T Services, Inc., GN Docket No. 14-177, WT Docket No. 10-112 (September 10, 2018), page 15; Comments of T-Mobile USA, Inc., GN Docket No. 14-177, WT Docket No. 10-112 (September 10, 2018), page 20; Comments of Nokia, GN Docket No. 14-177, WT Docket No. 10-112 (September 10, 2018), page 4; Comments of the Telecommunication Industry Association, GN Docket No. 14-177, WT Docket No. 10-112 (September 10, 2018), pages 6-7; Comments of the Competitive Carriers Association, GN Docket No. 14-177, WT Docket No. 10-112 (September 10, 2018), page 7.

[4] SES Comments, pages 6-7 and Annex A; SpaceX Comments, pages 4-5; Boeing Comments, page 5.

shorter than the distance traveled by 24 GHz signals. The shorter propagation distance of 50 GHz band signals has several important consequences. First, the PFD Contour of a 50 GHz earth station will be much smaller than the PFD Contour of a 24 GHz earth station. Second, a very large number of antenna will be required for widespread terrestrial deployment in the 50 GHz band. While this type of deployment may be economic in dense urban areas, it is unlikely that widespread terrestrial 5G deployment in the 50 GHz band will be economic in less dense areas. Moreover, terrestrial mobile operators will have access to very significant amounts of new lower frequency spectrum with propagation characteristics that support more cost-effective deployment in lower population density areas.

Given these facts, application of the 24 GHz cap of three earth stations in a county and fifteen earth stations in a PEA will unnecessarily restrict the deployment of FSS earth stations using the 50 GHz band. Although large numbers of individually licensed earth stations are not expected to be deployed, the much smaller PFD Contour of a 50 GHz earth station makes the 24 GHz caps unnecessary.[5] In the alternative and at a minimum, caps on the number of earth stations in a county or PEA should be limited to Tier 1 areas, where widespread deployment of terrestrial networks is somewhat more likely.[6]

The propagation characteristics of the 50 GHz band also support relaxed population coverage limits, particularly in Tier 2 and Tier 3 areas where widespread terrestrial deployment is unlikely. Accordingly, in Tier 2 and Tier 3 areas, Telesat supports the removal of population coverage limits as has been proposed by SES.[7] Alternatively, Telesat believes relaxed coverage limits, such as the ones proposed by SpaceX, should be applied.[8]

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[5] SpaceX Comments, pages 6-7; Boeing Comments, pages 5-6.
[6] SES Comments, pages 4-5.
[7] SES Comments, pages 4-6.
[8] SpaceX Comments, pages 6-7.

Finally, in Tier 2 and Tier 3 areas, the prohibition on coverage of major roadways and passenger railways by the PFD Contour of an earth station is also unnecessarily restrictive of earth station deployment.[9] Gateway earth stations must be located where there is access to fibre-optic links, reliable prime power and ease of access for technical staff. A prohibition on inclusion of a major highway or passenger railway in the PFD Contour of an earth station located in a rural area significantly restricts cost effective siting of 50 GHz earth stations. Furthermore, given the large number of antennas required in the 50 GHz band for widespread terrestrial deployment and the availability of lower frequency bands to terrestrial operators that will make deployment along transportation corridors in less densely populated areas more economically viable, it is unlikely that terrestrial operators will deploy 50 GHz 5G networks where major roadways and passenger railways transit Tier 2 and Tier 3 areas.

IV. Conclusion

Telesat thanks the Commission for moving forward to establish sharing rules for the 50 GHz band. Access to this frequency band for gateway earth stations is a critical input to planned new GSO and NGSO satellite networks that will support ubiquitous high speed broadband service, such as Telesat's planned V-band LEO constellation. Sharing rules that are tailored to the specific characteristics of the spectrum and likely terrestrial deployment will achieve the twin objectives of maximizing efficient use of spectrum and ensuring that FSS operators can deploy services using advanced new V-band satellite networks in the U.S. Consistent with these objectives, Telesat proposes that individually licensed earth stations be permitted in the 50 GHz band under the following rules:

[9] See also SES Comments, page 7.

(1) if the earth station is located in a Tier 1 population area: (i) the PFD Contour of the earth station and of all other licensed earth stations in the county do not cover more than 0.1% of the population of the county; and, (ii) the PFD Contour does not contain any major event venue, urban mass transit route, passenger railroad, or cruise ship port and shall not cross any Interstate, Other Freeways and Expressways or Other Principal Arterial based on the Federal Highway Administration classification system;

(2) if the earth station is located in a Tier 2 or Tier 3 population area, the PFD Contour of the earth station does not contain any major event venue, urban mass transit route, or cruise ship port.

In Telesat's view, caps on the number of 50 GHz earth stations are not required in any area; should the Commission determine otherwise, at a minimum, they should be limited to Tier 1 areas.

Respectfully submitted,
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